

SLIP RING LASER ILLUMINATOR FOR SPEED DOMES

CLAIMS

I claim:

1. An fibre optic laser illuminator for surveillance camera speed domes, in which a laser beam is carried via a fibre optic cable to provide illumination from within a surveillance camera speed dome.
2. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which a laser's heavy components, comprising a power supply and a heatsink, are mounted outside the surveillance camera speed dome.
3. The fibre optic laser illuminator for surveillance camera speed domes of Claim 2, in which the laser's power supply and heatsink are mounted in a base for a support for the surveillance camera speed dome.
4. The fibre optic laser illuminator for surveillance camera speed domes of Claim 3, in which the support is a bent pole from which the surveillance camera speed dome is suspended.

the fibre optic cable outlet is mounted adjacent to and in alignment with the surveillance camera such that the laser beam is emitted from the fibre optic cable outlet in the direction in which the surveillance camera is pointing.

6. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which an illuminator dispersing lens is positioned adjacent to the fibre optic cable outlet such that the laser beam emitted from the fibre optic cable outlet is dispersed in the general direction in which the camera is pointed.
7. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which illuminator dispersing lens is mounted on a motorized subcarriage by which the position of the illuminator dispersing lens can be changed with respect to the fibre optic cable outlet to change an angle of dispersion of illumination.
8. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which the fibre optic cable outlet, the illuminator lens and the camera are mounted on a carriage that is rotatable within the speed dome.
9. The fibre optic laser illuminator for surveillance camera speed domes of Claim 8, in which the camera is mounted on the carriage by means of a motorized pivot mechanism that allows the camera to pivot perpendicular to a plane of rotatability of the carriage within the speed dome.
10. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which

the laser beam is carried via a fibre optic cable through an optical slip joint to provide illumination from a fibre optic cable outlet within the surveillance camera speed dome, one side of the optical slip joint being rotatable through multiple rotations together with a surveillance camera mounted within the surveillance camera speed dome.

11. The fibre optic laser illuminator for surveillance camera speed domes of Claim 10, in which the optical slip ring aligns an open end of a fibre optic cable with a rotatably opposing open end of fibre optic cable within a sealed joint housing such that a laser beam can travel across a small air space from the open end of the fibre optic cable attached to a laser to an opposing rotatable open end of a further fibre optic cable to a fibre optic cable outlet from which the laser beam is dispersed to illuminate a desired area.
12. The fibre optic laser illuminator for surveillance camera speed domes of Claim 11, in which the optical slip ring aligns the open end of the fibre optic cable with the rotatably opposing open end of fibre optic cable within the sealed joint housing such that the centre of the fibre optic cable is aligned with an axis of rotation of the opposing open end with respect to the open end.
13. The fibre optic laser illuminator for surveillance camera speed domes of Claim 12, in which the optical slip ring is surrounded by multiple channel electrical slip rings and brushes to provide low level power for a video signal and power for the surveillance camera from a stationary support to a rotating carriage on which the surveillance camera is mounted within the speed dome.

14. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which the laser beam is pulsed and the surveillance camera is synchronized such that it does not collect light until just after the time required for each pulse of the laser beam to be emitted from the fibre optic cable outlet and to bounce back to the camera from an inside surface of the speed dome, but does collect light thereafter until the time required for the laser beam to be reflected from a target area back to the surveillance camera.

15. The fibre optic laser illuminator for surveillance camera speed domes of Claim 14, in which each laser pulse has a duration that is less than the time it takes light to travel from an outer surface of the speed dome to a target area and back to the surveillance camera, in order that returning light during a camera light-collection phase will not overlap within the speed dome with light reflected from the inside surface of the speed dome from an end portion of the laser pulse emitted from the fibre optic cable outlet.

16. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which the laser draws at least 20 watts of power, and the fibre optic cable is approximately 1 millimeter in diameter.

17. The fibre optic laser illuminator for surveillance camera speed domes of Claim 1, in which the fibre optic cable is up to 4 meters long between the laser and fibre optic cable outlet.

18. The fibre optic laser illuminator for surveillance camera speed domes of Claim 4, in which the fibre optic cable outlet is mounted adjacent to and in alignment with the surveillance camera and an illuminator dispersing lens is positioned adjacent to the fibre optic cable outlet such that

the laser beam emitted from the fibre optic cable outlet is dispersed in the general direction in which the camera is pointed.

19. The fibre optic laser illuminator for surveillance camera speed domes of Claim 18, in which

- a) the laser beam is carried via a fibre optic cable through an optical slip joint to provide illumination from a fibre optic cable outlet within the surveillance camera speed dome, one side of the optical slip joint being rotatable through multiple rotations together with a surveillance camera mounted within the surveillance camera speed dome;
- b) the optical slip ring aligns an open end of a fibre optic cable with a rotatably opposing open end of fibre optic cable within a sealed joint housing such that a laser beam can travel across a small air space from the open end of the fibre optic cable attached to a laser to an opposing rotatable open end of a further fibre optic cable to a fibre optic cable outlet from which the laser beam is dispersed to illuminate a desired area;
- c) the optical slip ring aligns the open end of the fibre optic cable with the rotatably opposing open end of fibre optic cable within the sealed joint housing such that the centre of the fibre optic cable is aligned with an axis of rotation of the opposing open end with respect to the open end;
- d) the optical slip ring is surrounded by multiple channel electrical slip rings and brushes to provide low level power for a video signal and power for the surveillance camera from a

stationary support to a rotating carriage on which the surveillance camera is mounted within the speed dome.

20. The fibre optic laser illuminator for surveillance camera speed domes of Claim 18, in which the laser beam is pulsed and the surveillance camera is synchronized such that it does not collect light until just after the time required for each pulse of the laser beam to be emitted from the fibre optic cable outlet and to bounce back to the camera from an inside surface of the speed dome, but does collect light thereafter until the time required for the laser beam to be reflected from a target area back to the surveillance camera, and each laser pulse has a duration that is less than the time it takes light to travel from an outer surface of the speed dome to a target area and back to the surveillance camera, in order that returning light during a camera light-collection phase will not overlap within the speed dome with light reflected from the inside surface of the speed dome from an end portion of the laser pulse emitted from the fibre optic cable outlet.

21. The fibre optic laser illuminator for surveillance camera speed domes of Claim 19, in which the fibre optic cable outlet, the illuminator lens and the camera are mounted on a carriage that is rotatable within the speed dome, and the laser beam is pulsed and the surveillance camera is synchronized such that it does not collect light until just after the time required for each pulse of the laser beam to be emitted from the fibre optic cable outlet and to bounce back to the camera from an inside surface of the speed dome, but does collect light thereafter until the time required for the laser beam to be reflected from a target area back to the surveillance camera, and each laser pulse has a duration that is less than the time it takes light to travel from an outer surface of the speed dome to a target area and back to the surveillance camera, in order that returning light

during a camera light-collection phase will not overlap within the speed dome with light reflected from the inside surface of the speed dome from an end portion of the laser pulse emitted from the fibre optic cable outlet.